

A National Survey of Interventional Radiology Trainees

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Abstract

Aim

Interventional Radiology (IR) is a rapidly evolving specialty with increasing global demand. While surveys of UK and international trainees report high satisfaction, gaps in training exposure, research support, and gender diversity persist. No national data exists for IR training in Ireland. This survey evaluates trainee satisfaction, identifies training deficiencies, and explores improvement strategies.

Methods

A 13-item electronic survey was distributed to radiology trainees in the Republic of Ireland, assessing demographics, IR exposure, involvement in clinical services, preparedness for fellowships, and views on a diagnostic/interventional radiology (DR/IR) split. Free-text questions explored departmental strengths, areas for improvement, and contributors to gender imbalance.

Results

Thirty-one trainees responded (68% male, 21/31), with a response rate of 22%. 71% (22/31) intended to incorporate IR in future practice. Overall, 48% (15/31) were satisfied with IR training, 36% (11/31) dissatisfied, and 16% (5/31) neutral. Rostering for IR training varied with only 23% (7/31) having a fixed IR day weekly. 16/31 (52%) did not support a DR/IR split, and 55% (17/31) felt prepared for fellowships abroad. Key areas for improvement included enhancing trainee autonomy, teaching, vascular and oncology case exposure, and infrastructure. Lifestyle concerns, radiation exposure, and lack of female mentors were identified as drivers of gender imbalance.

Discussion/Conclusion

While IR training satisfaction in Ireland is moderate, several actionable improvements have been identified to optimise training nationwide.

Introduction

Interventional radiology (IR) has rapidly expanded since its inception. Increased demand for IR services has led to a growth of IR training programs globally. The same is true in Ireland, where the total number of IR trainees is currently seven. This number is based on the number of interventional radiology fellowships offered by the faculty of radiologist in Ireland. It does not account for the number of registrars pursuing higher training in interventional radiology abroad, predominantly in North America.

Radiology training in Ireland is overseen by The Faculty of Radiologists, Royal College of Surgeons of Ireland (RCSI). It is a five-year training program consisting of 4 core years of general radiology, followed by a fifth year in the trainee's subspecialty of choice. All radiology trainees rotate through IR as a component of their core training. Interested trainees subsequently apply for a fifth year of subspecialty training in IR, followed by 1-2 years of fellowship training. At the end of their fifth year of training or first year of fellowship, many trainees take the European Board of Interventional Radiology (EBIR) examination, overseen by the Cardiovascular and Interventional Radiological Society of Europe (CIRSE). Importantly, while EBIR certification is encouraged, it is not mandatory for registration within the Irish Medical Council as an interventional radiologist.

The Irish IR training curriculum follows the European Curriculum and Syllabus for Interventional Radiology, governed by CIRSE. This syllabus was introduced in 2013 in an effort to homogenize IR training programs across Europe by providing a standardized and structured pathway for trainees to develop the clinical and technical competencies to safely and effectively perform IR procedures ¹. The third edition of the curriculum, published in 2023, was approved as a European Training Requirement (ETR) for IR by the European Union of Medical Specialists, and serves as the basis for the EBIR examination ². The curriculum emphasizes the development of clinical skills, including patient assessment, procedure planning, image interpretation, and management of complications.

A survey by the British Society of Interventional Radiology (BSIR) Trainee Committee showed that the majority of IR trainees in UK-based programs are satisfied with the overall quality of their training ³. This aligns with international surveys of IR trainees which also demonstrated a high overall level of satisfaction with training programs across the regions surveyed ⁴. Importantly, these surveys highlighted several issues in need of improvement, including balancing the male-to-female ratio of IR trainees, earlier exposure to IR during medical training, competition for training opportunities with other specialities, perceived inadequacy of training opportunities in vascular, interventional oncology, stroke thrombectomy and pediatric IR procedures, and a lack of structured research support ^{3, 4}.

There remains an unmet need to survey the current state of the IR training environment in Ireland. The purpose of the present study was to survey trainees' experiences with and

perspectives on the IR curriculum and training program in Ireland and identify strategies to further improve IR training.

Methods

An electronic survey was created using the Google Forms[®] platform. Survey questions were designed by radiology trainees and medical students with special interest in IR based on the current IR curriculum and personal experience. The survey was supported by a group of consultant interventional radiologists and distributed directly via email to trainees across the first 4 years of postgraduate radiology training (i.e., radiology registrars in their core radiology training years). The survey was opened on 12 February 2025 and available for one month. The survey consisted of 13 questions, of which 3 allowed free-text answers (Supplementary Material). Quantitative data were analyzed in Microsoft Excel 365[®] and a thematic analysis was undertaken for the three free-text questions. Research ethics board approval was not required for this survey due to the absence of identifiable data and patient information.

Results

Quantitative Data

The survey was sent to 140 eligible trainees, 35 in each training year. There was a total of 31 responses, with a response rate of 22%. 68% (21/31) of respondents were male. Demographic information about trainees, including training year and centre, are summarized in Table 1. The overwhelming majority of respondents were in postgraduate training year 3 (16/31; 52%).

Approximately 71% (22/31) of respondents indicated an interest in incorporating IR into their future practice. 9/31 (29%) of these responses were from specialist registrars in interventional radiology. With respect to their satisfaction with exposure to IR training, 48% (15/31) of respondents were satisfied, 36% (11/31) of respondents were not satisfied, and 16% (5/31) were neutral.

With respect to IR training days rostered, 23% (7/31) of respondents were rostered 1 day per week, 26% (8/31) were rostered 1 day per fortnight, and 19% (6/31) were rostered 1 day per month. 10/31 (32%) of respondents expressed highly variable IR training day scheduling, ranging from never to rostering according to the trainee's interest in IR.

17/31 (55%) of respondents believed they have adequate exposure to training opportunities in vascular access and image-guided drains and biopsies (Figure 1). The majority of respondents preferred more procedural training opportunities in arterial endovascular

interventions (24/31; 77%), venous endovascular interventions (18/31; 58%), interventional oncology (23/31; 74%), paediatric IR (19/31; 61%), and stroke thrombectomy (21/31; 68%).

With respect to trainee involvement with different hospital services, 4/31 (13%) of respondents were involved with IR day ward admissions and IR ward rounds within their hospital (Figure 2). 2/31 (6%) of trainees were involved with IR clinics. 15/31 (48%), 18/31 (58%), and 17/31 (55%) of respondents indicated that IR day ward admissions, ward rounds, and IR clinics are not available at their institution, respectively. 13/31 (42%) of trainees were involved in multidisciplinary meetings (MDM) and 5/31 (16%) were involved in morbidity and mortality (M&M) meetings within their institutions.

16/31 (52%) of respondents believe there is no need for an interventional-diagnostic radiology split at present. The most common reason provided was that the Irish system does not have the infrastructure to facilitate a DR/IR split at the present time, but that this will become an inevitability over time. One respondent suggested a role for hybrid training, acknowledging the strong diagnostic skills required by IR consultants.

17/31 (55%) of respondents believed that the training they have received in Ireland has prepared them well for fellowship training abroad. 5/31 (16%) of respondents did not think they are prepared for fellowship training abroad and 6/31 (19%) of respondents were unsure. One respondent suggested being prepared for diagnostic fellowship, but more procedural training would be required to be prepared for IR fellowship. One participant expressed feeling prepared for fellowships abroad only because of additional self-directed training such as completing training courses outside of their training centre.

Qualitative Data

Thematic analysis of the three free-text survey questions is summarised in Table 2. In response to the question, “How can IR training be improved in your hospital”, respondents suggested increased exposure to IR training, workflow and infrastructure changes such as the need for IR day wards and dedicated minor procedure rooms, greater exposure to advanced procedures such as interventional oncology, and greater autonomy for trainees. In response to the question, “What works well in your IR department”, respondents reported good trainee autonomy such as trainee led lists and PICC line service, workflow and infrastructure factors, good support from senior staff, opportunities for more IR training based on interest, and a diverse high-volume case mix. These suggestions were highly site dependent. Finally, in response to the question, “What do you think drives the gender imbalance in IR”, respondents suggested lifestyle factors such as the demanding and unpredictable workload of IR and concerns about family planning, lack of female mentorship, systemic factors that perpetuate

the patriarchy in medicine and surgery, and concerns regarding radiation exposure as contributing factors.

Discussion

Overall, there is moderate satisfaction with IR training in Ireland, with representation across all postgraduate training years and training centres in the nation. Some factors that account for this include the high quality of training received from senior faculty, and greater opportunities for training based on a demonstrable interest in IR. However, this survey revealed several areas in need of improvement to further enhance the quality of IR training in Ireland. The main area of concern was a lack of training opportunities in vascular IR, interventional oncology, paediatric IR and stroke thrombectomy.

The lack of training opportunities in vascular IR is accounted for by the fact that in some institutions, vascular interventions are performed by non-IR staff, such as vascular surgeons. This, in turn, creates competition for training opportunities among vascular surgery and IR trainees. To address this concern, it has previously been recommended that IR departments must proactively retain ownership of relevant vascular procedures ³.

Paediatric IR is a relatively new subspeciality with highly variable availability across training sites in Ireland. However, the results of this survey indicate a desire to enhance trainee skill development in paediatric IR. To accommodate a growing interest in paediatric IR training, Irish training programs should allow greater flexibility for trainees to pursue out-of-program training ³.

There is a strong desire by Irish trainees for increased training in interventional oncology. This is unsurprising, given that IO procedures are increasingly being incorporated into oncological treatment algorithms ⁵. At present, training exposure is highly variable across the country, with IO procedures conducted in a few specialist centres by a limited number of highly trained consultants, often with long waiting lists. One strategy proposed by a respondent to address these concerns is to introduce dedicated IO procedure days or timeslots within departmental workflows. Programs should also incorporate flexibility for trainees to seek external IO training, such as those offered by CIRSE.

Mechanical stroke thrombectomy is currently only performed at a few specialist centres in Ireland, by a limited number of highly trained consultants. This accounts for the relative lack of training opportunities in stroke thrombectomy for trainees.

An overwhelming majority of trainees expressed adequate training opportunities in image-guided biopsies and drains. This is reflective of a competency-based allocation of responsibility within the Irish IR training curriculum, which allows for lower year radiology

trainees to perform biopsies and drains, with more advanced IR procedures performed by senior trainees and fellows.

Furthermore, the quality of IR training in Ireland may improve if more trainees participate in a broader spectrum of clinical activities including day ward admissions, ward rounds, IR clinics, MDT, and M&M meetings. It is acknowledged that at present, financial and infrastructural limitations preclude the possibility of introducing dedicated IR wards, clinics and minimally invasive procedure rooms at many institutions, but this may become a future inevitability as demand for IR services continues to increase.

This survey has a number of limitations. The main limitation is the low response rate. Female trainees are underrepresented and less than full-time trainees (LTFTs) are not represented in this survey. The reasons for this are complex and multifactorial, and an in-depth discussion is beyond the scope of the present study. There is a high degree of variability in training opportunities, case mix and consultant-led teaching and supervision across different training sites, which introduces variability in the quality of IR training across the country. This limits the external validity of survey data across institutions. This may be mitigated with the introduction of the ISIR Trainee Committee, which will work towards limiting regional discrepancies and inequalities in IR training through collaborative and cooperative curriculum development and implementation across the various training regions. Future surveys and annual updates may be required to track the longitudinal effects of IR training curriculum revisions in Ireland.

This first-of-its kind national survey of trainees suggests an overall moderate level of satisfaction with IR training in Ireland. Several key areas for development have been identified. Greater training opportunities in vascular IR, interventional oncology, paediatric IR, and stroke thrombectomy are indicated. Trainees may also benefit from greater involvement with IR ward admissions and rounds, IR clinics and multidisciplinary and morbidity and mortality meetings at their respective training sites. Females remain underrepresented in IR for a multitude of reasons. The quality of IR training in Ireland may be improved by addressing these discrepancies and inequalities across the various training regions. Future surveys will be required to monitor progress.

Declarations of Conflicts of Interest:

None declared.

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Appendix:

Tables

Table 1: Demographics of Survey Respondents

Number of respondents (N)		31
Male (%)		21 (67.7)
Female (%)		10 (32.3)
Training Year (%)	1	5 (16.1)
	2	5 (16.1)
	3	16 (51.6)
	4	5 (16.1)
Training Centre (%)*	UHG	6 (33.3)
	TUH	3 (16.7)
	SJH	2 (11.1)
	UHL	2 (11.1)

	UHW	3 (16.7)
	MMUH	1 (5.6)
	SVUH	1 (5.6)

*This question was optional. There were 18 responses.

Hospital Abbreviations Legend

UHG	University Hospital Galway
TUH	Tallaght University Hospital
SJH	St. James's Hospital
UHL	University Hospital Limerick
UHW	University Hospital Waterford
MMUH	Mater Misericordiae University Hospital
SVUH	St. Vincent's University Hospital

Table 2: Thematic Analysis for Free Text Questions

A. "How IR Training Can be Improved in your Hospital?"	
Themes	Additional Comments
Increased opportunity for and scope of IR training	- Regular exposure such as training blocks - Increase number of rostered training days - Greater exposure to advanced IR procedures (eg. vascular, interventional oncology, pediatric IR)
Workflow and infrastructure considerations	- Need for an IR day ward - Need for more IR suites - Dedicated ultrasound-guided procedure room - Dedicated minor procedures room
Greater trainee autonomy	- Registrar led lists (e.g. PICC line service) - Trainees completing initial steps in complex cases
Supports from senior staff	- Dedicated teaching sessions - Direct supervision during cases - Imaging review prior to cases
B. "What Works Well in your IR Department?"	
Themes	Additional Comments
Greater trainee autonomy	- Trainees as primary operator - Registrar led lists (eg. PICC line service)
Dedicated IO service	Daily slots for oncology cases
Supports from senior staff and colleagues	- Good quality teaching - Approachable consultants

	• Friendly training environment • Well-trained nurses and radiographers • Efficient workflow
Opportunities for more IR training	• Trainees with a demonstrable interest get more IR training opportunities • Fair rostering of IR trainees
Case mix	• High volume of cases • Diverse mix of cases
C. "What Drives the Gender Imbalance in IR?"	
Themes	Additional Comments
Lifestyle factors	• IR is more demanding than DR • IR workflow is less predictable • Family planning concerns • Perception of better work-life balance in DR compared to IR • Financial strain of IR training
Lack of female mentors	• Relative lack of female IR role models in Ireland
Systemic factors	• Intake scheme is inherently gender imbalanced • Many IR trainees have a surgical background which itself is male dominated
Radiation exposure	• Fear of additional radiation exposure • Impact of radiation exposure during pregnancy

Figures

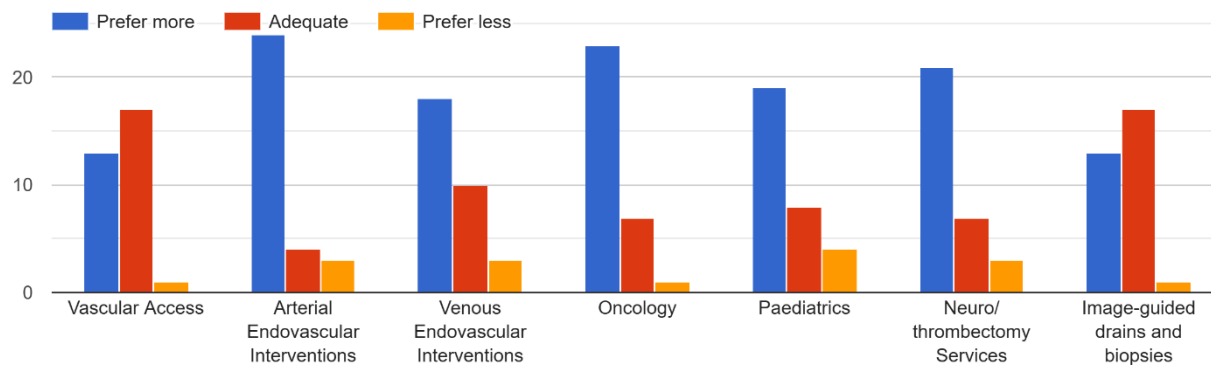


Fig. 1 Perceived adequacy of training opportunities in various IR procedures. Y-axis represents number of respondents.

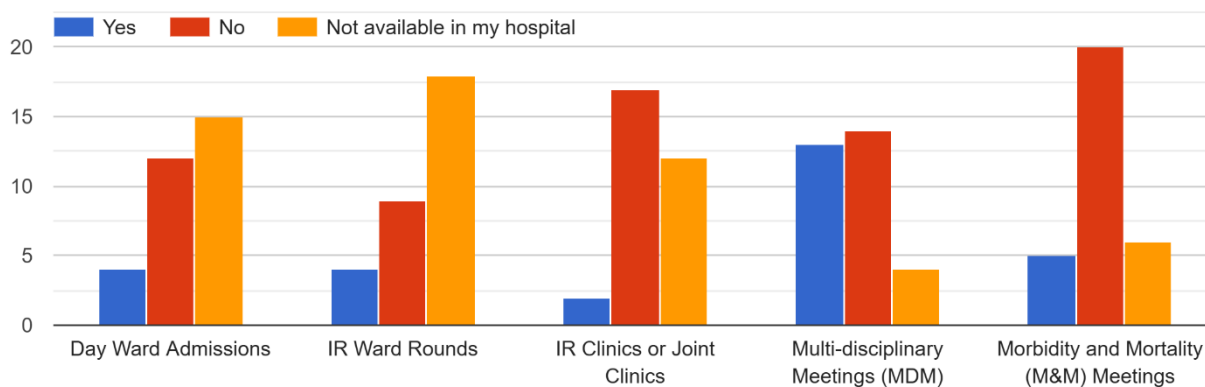


Fig. 2 Trainee involvement in various hospital-based IR services. Y-axis represents number of respondents.

Supplementary Material: Survey Questions and Answer Choices

Question	Answer Choices
1) What is your gender?	Male, Female, prefer not to say
2) Would you like to incorporate IR into your future practice?	Yes, No
3) What year of training are you in?	1, 2, 3, 4, 5
4) Please indicate your training centre (not mandatory).	Short-answer text
5) Overall, are you satisfied with your exposure to IR training?	Yes, No, Neutral
6) How often do you get rostered for IR training days?	1 day per week, 1 day per fortnight, 1 day per month, other (free-text)
7) For each of the following, please indicate if the amount of procedural training opportunities are adequate, if you would prefer more, or if you would prefer less.	Vascular access, arterial endovascular interventions, venous endovascular interventions, oncology, pediatrics, neuro/thrombectomy service, image-guided drains and biopsies
8) Please indicated your involvement with the following: day ward admissions, IR ward rounds, IR clinics or joint clinics, multidisciplinary meetings, morbidity and mortality meetings	Yes, No, not available in my hospital
9) Do you think there is a need for DR/IR split?	Yes, No, other (free-text)
10) Do you think the training you have received in Ireland has prepared you well for fellowships abroad?	Yes, No, other (free-text)
11) How can IR training be improved in your hospital?	Free-text
12) What works well in your IR department?	Free-text
13) What do you think drives the gender imbalance in the IR subspeciality?	Free-text